GEARED ARCHITECTURE WITH SPEED CHANGE DEVICE FOR GAS TURBINE ENGINE

[0001] This application is a continuation of U.S. application Ser. No. 13/437,448, filed on Apr. 2, 2012.

BACKGROUND

[0002] This disclosure relates to a geared architecture for a gas turbine engine.

[0003] One type of geared turbofan engine includes a two-spool arrangement in which a low spool, which supports a low pressure turbine section, is coupled to a fan via a planetary gear train. A high pressure spool supports a high pressure turbine section. Low and high pressure compressor sections are respectively supported by the low and high spools.

[0004] The planetary gear train includes a planetary gear set surrounding and intermeshing with a centrally located sun gear that is connected to the low spool. A ring gear circumscribes and intermeshes with the planetary gears. A fan shaft supports the fan. The fan shaft is connected to either the planetary gears or the ring gear, and the other of the planetary gears and ring gear is grounded to the engine static structure. This type of planetary gear arrangement can limit the design speeds of and configuration of stages in the low and high pressure turbine sections.

SUMMARY

[0005] In one exemplary embodiment, a gas turbine engine includes first and second shafts rotatable about a common axis. The gas turbine engine includes a fan, and first and second gear trains interconnected to one another and coupling the first shaft to fan.

[0006] In a further embodiment of any of the above, the first gear train is an epicyclic gear train.

[0007] In a further embodiment of any of the above, the second gear train is configured to provide a speed reduction.

[0008] In a further embodiment of any of the above, the first gear train is arranged between the first shaft and the second gear train.

[0009] In a further embodiment of any of the above, the second gear train is arranged between the first shaft and the first gear train.

[0010] In a further embodiment of any of the above, the epicyclic gear train is a differential gear train that includes a sun gear. Planetary gears are arranged about and intermesh with the sun gear. A ring gear circumscribes and intermeshes with the planetary gears.

[0011] In a further embodiment of any of the above, the planetary gears are supported by a carrier. The carrier is configured to receive rotational input from one of the first shaft and the second gear train.

[0012] In a further embodiment of any of the above, the second gear train is configured to receive rotational input from the sun gear.

[0013] In a further embodiment of any of the above, the gas turbine engine includes a first turbine section that is supported on the first shaft. Second compressor and turbine sections are supported on the second shaft, and a first compressor section is coupled to the first gear train.

[0014] In a further embodiment of any of the above, the gas turbine engine includes an inducer that is coupled to the second gear train.

[0015] In a further embodiment of any of the above, first and second shafts respectively provide low and high spools. The first compressor and turbine sections are low pressure compressor and turbine sections. The second compressor and turbine sections are high pressure compressor and turbine sections.

[0016] In one exemplary embodiment, a gas turbine engine includes first and second shafts rotatable about a common axis. The gas turbine engine includes a fan. First and second gear trains are interconnected to one another and couple the first shaft to fan. The first gear train is an epicyclic gear train. A first turbine section is supported on the first shaft. Second compressor and turbine sections are supported on the second shaft, and a first compressor section coupled to the first gear train. First and second shafts respectively provide low and high spools. The first compressor and turbine sections are low pressure compressor and turbine sections. The second compressor and turbine sections are high pressure compressor and turbine sections.

[0017] In a further embodiment of any of the above, the second gear train is configured to provide a speed reduction.

[0018] In a further embodiment of any of the above, the first gear train is arranged between the first shaft and the second gear train.

[0019] In a further embodiment of any of the above, the second gear train is arranged between the first shaft and the first gear train.

[0020] In a further embodiment of any of the above, the epicyclic gear train is a differential gear train that includes a sun gear. Planetary gears are arranged about and intermesh with the sun gear. A ring gear circumscribes and intermeshes with the planetary gears.

[0021] In a further embodiment of any of the above, the planetary gears are supported by a carrier. The carrier is configured to receive rotational input from one of the first shaft and the second gear train.

[0022] In a further embodiment of any of the above, the second gear train is configured to receive rotational input from the sun gear.

[0023] In a further embodiment of any of the above, an inducer is coupled to the second gear train.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The disclosure can be further understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

[0025] FIG. **1** schematically illustrates a gas turbine engine embodiment.

[0026] FIG. **2** is a schematic view of a geared architecture embodiment for the engine shown in FIG. **1**.

[0027] FIG. **3** is a schematic view of another geared architecture embodiment.

[0028] FIG. **4** is a schematic view of a geared architecture embodiment with an inducer.

[0029] FIG. **5** is a schematic view of yet another geared architecture embodiment.

[0030] FIG. **6** is a schematic view of another geared architecture embodiment with an inducer.

[0031] FIG. **7** is a schematic view of yet another geared architecture embodiment with an inducer.

[0032] FIG. **8** is a schematic view of still another geared architecture embodiment with an inducer.

[0033] FIG. **9**A is a schematic view of an epicyclic gear train having a first example geometry ratio.